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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/918,253	07/30/2001	Sheng Ma	YOR920000679US1	2311

7590 03/31/2004
Ryan, Mason & Lewis, LLP
90 Forest Avenue
Locust Valley, NY 11560

EXAMINER

CORRIELUS, JEAN M

ART UNIT	PAPER NUMBER
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2172

DATE MAILED: 03/31/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/918,253

Applicant(s)

MA ET AL.

Examiner

Jean M Corrielus

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 2-8, 16-18, 20-26 and 34-36 is/are allowed.
- 6) ☒ Claim(s) 1, 9, 10, 15, 27, 28, 33 and 37-38 is/are rejected.
- 7) ☐ Claim(s) 11-14 and 29-32 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

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DETAILED ACTION

This office action is in response to the amendment filed on January 20, 2004, in which claims 1-38 are presented for further examination.

Response to Arguments

1. Applicant's arguments filed on January 20, 2004 have been fully considered but they are not persuasive. (see Examiner's remark section).

Remark

(A). Applicant asserted that the claimed invention is directed toward mutual dependence and thus is able to consider interactions, e.g., more just a one way relationship (see specification page 7, lines 22-page 8, line 5) in contrary to Kitts, which is disclosed a conditional independence wherein such conditional independence is a one way relationship. Applicants also asserted that Kitts silent to mutual dependence patterns and a mutual dependence threshold value and he does not disclose the use of outputting the identified mutual dependency patterns based on results of the comparisons. The examiner disagrees with the precedent assertion. It is noted, however, that the mutual dependence as described the specification page 7, line 22-page 8 line 5 does not allow more just a one way relationship. The specification, on the other hand, discloses if a part of an m-pattern occurs, it is likely, to a high probability, that the other part of the m-pattern will be seen. Kitts, however, states, if we assume mutual independence between products, then the expected profit after buying a product a is equal to the probability of buying b given a, $\Pr(b/a)$ multiplied by the profit Π of b. this idea behind incremental profit is to maximize the profit minus the profit you would expect to receive due to the natural course of customer's purchasing,

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which is similar to the description provided by applicants ' specification page 7, line 22-page 8, line 5. Therefore, the aforementioned assertion is moot.

Information Disclosure Statement

2. The information disclosure statement (IDS) filed on August 16, 2001 complies with the provisions of M.P.E.P. 609. It has been placed in the application file. The information referred to therein has been considered as to the merits.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1, 9-10, 15, 19, 27-28, 33 and 37-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over kitts et al., (hereinafter □Kitts□) article entitled □Cross-Sell: A fast

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promotion tunable customer item recommendation method based on conditionally independent probabilities.

As to claim 1, Kitts discloses the claimed features identifying sets of items in the input data set as mutual dependence patterns based on respective comparisons of conditional probability values associated with each of the sets of item to a predetermined mutual dependence threshold value \square as creating a customer recommendation based on the individual conditional probability (page 438, section 4, 4.1). Kitts does not explicitly disclose the use of outputting the identified mutual dependence patterns based on result of the comparisons. Kitts, however, discloses a response probability which the probability of an item b being bought given a customer's purchase of item a by measuring the probability of customer responding to item with respect to the graph of the highest conditional probability (see figure 1). Figure 2 of Kitts has shown the overall effectiveness of the automated recommendations, compared to the control recommendations. Kitts also discloses the use to promote products, which have high mutual attractions to each other. Kitts state that although lift does not necessarily maximize sales probability or profit, previous work has indicated that profit can be generated by cross-selling products with high lift score, thereby increasing in profit from items that were moved together (pages 438-440). Kitts, also, states, if we assume mutual independence between products, then the expected profit after buying a product a is equal to the probability of buying b given a, $\Pr(b/a)$ multiplied by the profit Π of b, thereby maximizing the profit minus the profit you would expect to receive due to the natural course of customer's purchasing. Therefore, it would have been obvious to one of ordinary skill in the art of data processing, at the time the present invention was made to modify the system of Kitts, wherein the imputation and collaborative filtering, provided (see Kitts

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section 2) would incorporate the use of outputting the identified mutual dependence patterns based on result of the comparisons. One having ordinary skill in the art at the time the invention was made would have found it motivated to do such a modification would provide the improvements in the automated system of Kitts the enhanced capability of maximizing the profit minus the profit you would expect to receive due to the natural course of customer's purchasing.

As to claim 9, Kitts discloses the claimed obtaining an input data set of items (Kitts' section 2); searching the input data set of items to identify one or more sets of items in the input data set as one or more patterns based on respective comparisons of conditional probability values associated with each of the one or more sets of item to a predetermined threshold value, as creating a customer recommendation based on the individual conditional probability (page 438, section 4, 4.1). Kitts does not explicitly disclose the use of outputting the identified mutual dependence patterns based on result of the comparisons. Kitts, however, discloses a response probability which the probability of an item b being bought given a customer's purchase of item a by measuring the probability of customer responding to item with respect to the graph of the highest conditional probability (see figure 1). Figure 2 of Kitts has shown the overall effectiveness of the automated recommendations, compared to the control recommendations. Kitts also discloses the use to promote products, which have high mutual attractions to each other. Kitts state that although lift does not necessarily maximize sales probability or profit, previous work has indicated that profit can be generated by cross-selling products with high lift score, thereby increasing in profit from items that were moved together (pages 438-440). Kitts, also, states, if we assume mutual independence between products, then the expected profit after

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buying a product a is equal to the probability of buying b given a, $\Pr(b/a)$ multiplied by the profit Π of b, thereby maximizing the profit minus the profit you would expect to receive due to the natural course of customer's purchasing. Therefore, it would have been obvious to one of ordinary skill in the art of data processing, at the time the present invention was made to modify the system of Kitts, wherein the imputation and collaborative filtering, provided (see Kitts section 2) would incorporate the use of outputting the identified mutual dependence patterns based on result of the comparisons. One having ordinary skill in the art at the time the invention was made would have found it motivated to do such a modification would provide the improvements in the automated system of Kitts the enhanced capability of maximizing the profit minus the profit you would expect to receive due to the natural course of customer's purchasing.

As to claims 10 and 33, Kitts discloses the use of normalizing the input data.

As to claim 15, Kitts discloses the use of a lift or mutual affinity, which is a symmetric measure. Kitts discloses also the use of untransforming lift score because it is easier to interpret from the user (see Kitts' section 4.1.2). This implication discloses the claimed "converting the one or more identified patterns into a human readable format".

As to claims 19, 27 and 37, the limitations of claims 19, 27 and 37 have been noted in the rejection of claims 1 above. They are, therefore, rejected under the same rationale.

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As to claims 28 and 38, the limitations of claims 28 and 38 have been noted in the rejection of claims 9 and 15 above. It is, therefore, rejected under the same rationale.

Allowable Subject Matter

Claims 11-14 and 29-32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 2-8, 16-18, 20-26 and 34-36 are allowable in light of the Applicant's argument and in light of the prior art made of record.

Reasons For Indicating Allowable Subject Matter

The following is an examiner's statement of reasons for allowance: Upon searching a variety of databases, the examiner respectfully submits that --identifying a set of items in the input data set, which includes at least two subsets of at least one item, as a pattern when the set of items has a conditional probability value computed therefor that is not less than a predetermined threshold value, wherein the conditional probability value is indicative of a probability that both of the at least two subsets of at least one item will occur given that one of the at least two subsets of at least one item has occurred—in claim 2 and 20; --identifying a set of items in the input data set as a pattern when the set of items has a conditional probability value computed for the set of items minus a particular item of the set, given the particular item of the set, that is not less than a predetermined threshold value—in claim 5, 16, 23 and 34; and in conjunction with all other limitations of the dependent and independent claims are not taught nor

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suggested by the prior art of record (PTO-892, 1449). Therefore, all pending claims 2-8, 16-18, 20-26 and 34-36 are hereby allowed.

Since allowable subject matter has been indicated, applicant is encouraged to submit formal drawings in response to this Office action. The early submission of formal drawings will permit the Office to review the drawings for acceptability and to resolve any informalities remaining therein before the application is passed to issue. This will avoid possible delays in the issue process.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for allowance."

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jean M. Corrielus whose telephone number is (703) 306-3035. The examiner can normally be reached on Tuesday - Friday (7:30 am - 5:00 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E Breene can be reached on (703) 305-9790. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jean M. Corrielus

Patent Examiner

March 29, 2004